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PATTERSON & SHERIDAN, LLP
3040 POST OAK BLVD
SUITE 1500
HOUSTON, TX 77056

EXAMINER	
CURS, NATHAN M	

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2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/642,479	DUAN ET AL.
	Examiner	Art Unit
	Nathan Curs	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8 and 15-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8 and 15-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 2, 4 and 15 are objected to because of the following informalities:

Claim 2 should depend from claim 1 instead of from itself, and "an average optical power" should be "the average optical power" for proper antecedence language in light of claim 1.

In claim 4 line 1, “prior to the calculating step” should be “prior to the noise spectrum density calculating step” for clarity in light of the two different calculating steps of claim 3.

In claim 15 line 12, "the average sampled points" should be "the average power of the sampled points" for consistency with line 7 of the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 8, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shin et al. (“Shin”) ("A novel optical signal-to-noise ratio monitoring technique for WDM networks", Shin et al.; Optical Fiber Communication Conference, 2000; Volume 2, 7-10 March 2000 Pages: 182-184) in view of Ames et al. (“Ames”) (US Patent No. 6661817).

Regarding claim 1, Shin discloses a method of utilizing a performance monitor cell for distributed optical performance monitoring in a network (page 182, section "I. Introduction"),

comprising: selecting a frequency range based on network traffic protocol and transmission rate (pages 182 section "I. Introduction" and first paragraph of section "II. Experiments", where using the FFT data in the range of 40 ~ 50 kHz for the 10Gbps pattern signal reads on selecting a frequency range based on network traffic protocol and transmission rate); tapping a portion of a signal in the network (fig. 1, element "OSNR monitor"); generating a spectrum in the frequency domain utilizing a Fast Fourier Transform (page 182, first paragraph of section "II. Experiments"); generating a noise spectrum density from the spectrum and the frequency range (pages 182 and 183, section "II. Experiments", where noise spectrum density is determined from using the FFT in the range of 40 ~ 50 kHz); and calculating an optical signal noise ratio (OSNR) from the noise spectrum density and an average power, wherein the optical signal noise ratio is used to determine the performance of the network (pages 182 and 183, sections "I. Introduction" and "II. Experiments"). Shin discloses monitoring the average power of the tapped signal (fig. 1, photodiode in the top branch of the 1:1 splitter), and discloses A to D conversion for the FFT (fig. 1, element "AD Converter"), but does not disclose sampling 1024 points from a digitized version of the tapped signal and then determining the average power from those plurality of points. Ames discloses monitoring optical power using a photodiode followed by an current to voltage conversion followed by A to D conversion of the voltage followed by sampling the digital voltage signal and calculating the average optical power using the sampled digital voltage (fig. 1 and col. 5, lines 32-50 and col. 6, lines 1-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the optical power detection method of Shin with the digital average optical power detection method of Ames, to provide the advantage of being able to store the calculated optical power values in memory for monitoring. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to calculate the average optical power of the A to D converted

continuous voltage using 1024 continuous samples for the calculation, since averaging over any large number of points results in a more accurate average than averaging over a small number of points.

Regarding claim 2, the combination of Shin and Ames discloses the method of Claim 1, further comprising computing an average optical power from a pre-saved calibration table (Ames: col. 5, lines 32-50 and col. 6, lines 31-47, as applicable in the combination, where the optical power equation coefficients stored in memory indicate a pre-saved calibration table).

Regarding claim 3, Shin discloses a method of utilizing a performance monitor cell for distributed optical performance monitoring in a network (page 182, section "I. Introduction"), comprising: tapping a portion of a signal in the network (fig. 1, element "OSNR monitor"); calculating a noise spectrum density from a spectrum and a frequency range based on network traffic protocol and transmission rate (pages 182 and 183, section "II. Experiments", where using the FFT data in the range of 40 ~ 50 kHz for the 10Gbps pattern signal reads on selecting a frequency range based on network traffic protocol and transmission rate and where noise spectrum density is determined from using the FFT in the range of 40 ~ 50 kHz) and computing an optical signal noise ratio (OSNR) from the noise spectrum density and a predetermined calibration data, wherein the optical signal noise ratio is used to ascertain the performance of the network (pages 182 and 183, sections "I. Introduction" and "II. Experiments", where the known values for variables "optical bandwidth" and "resolution bandwidth" in the OSNR calculation read on predetermined calibration data). Shin discloses monitoring the average power of the tapped signal (fig. 1, photodiode in the top branch of the 1:1 splitter), and discloses A to D conversion for the FFT (fig. 1, element "AD Converter"), but does not disclose sampling a plurality of points from a digitized version of the tapped signal. Ames discloses monitoring optical power using a photodiode following by an current to voltage conversion followed by A to

D conversion of the voltage followed by sampling the digital voltage signal for some inherent predetermined amount of time and then calculating the average optical power using the sampled digital voltage (fig. 1 and col. 5, lines 32-50 and col. 6, lines 1-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the optical power detection method of Shin with the digital average optical power detection method of Ames, to provide the advantage of being able to store the calculated optical power values in memory for monitoring.

Regarding claim 4, the combination of Shin and Ames discloses the method of Claim 3, prior to the calculating step, further comprising computing a Fast Fourier Transform and obtaining a spectrum in the frequency domain (Shin: pages 182 and 183, section "II. Experiments").

Regarding claim 5, the combination of Shin and Ames discloses the method of Claim 4, prior to the computing of the spectrum in the frequency domain, further comprising computing an average power of the plurality of points (Ames: fig. 1 and col. 5, lines 32-50 and col. 6, lines 1-47, as applicable in the combination).

Regarding claim 6, the combination of Shin and Ames discloses the method of Claim 5, prior to the computing step of the average power of the plurality of points, the plurality of points are sampled continuously at a frequency (Ames: fig. 1 and col. 5, lines 32-50 and col. 6, lines 1-47, as applicable in the combination, where the sampling of the digital voltage signal for the optical power calculation happens continuously because "monitoring" of the optical power is inherently continuous).

Regarding claim 8, the combination of Shin and Ames discloses the method of Claim 3, wherein the computing of the OSNR is based on the following equation: OSNR = (P.sig * Bo)/(Pase * R) where the symbol "Psig" denotes a signal power, the symbol "Pase" denotes an

Amplified Spontaneous Emission (ASE) power, the symbol "Bo" denotes a filter band width, and the symbol "R" denotes a wavelength resolution (Shin: page 183, specifically equation "(3)").

Regarding claim 15, Shin discloses a method of utilizing a performance monitor cell to monitor a channel in a multiplexer (page 182, section "1. Introduction"), comprising: tapping a portion of a signal from the channel (fig. 1, element "OSNR monitor"); calculating a noise power density, wherein the noise power density is calculated by utilizing a spectrum in a frequency domain and a selected frequency range based on traffic protocol and transmission rate (pages 182 and 183, section "11. Experiments", where using the FFT data in the range of 40 ~ 50 kHz for the 10Gbps pattern signal reads on selecting a frequency range based on network traffic protocol and transmission rate and where noise spectrum density is determined from using the FFT in the range of 40 ~ 50 kHz); and determining an optical signal to noise ratio (OSNR) from the noise spectrum density and an average power, wherein the optical signal noise ratio is used to ascertain the performance of the multiplexer (pages 182 and 183, sections "I. Introduction" and "II. Experiments"). Shin discloses monitoring the average power of the tapped signal (fig. 1, photodiode in the top branch of the 1:1 splitter), and discloses A to D conversion for the 65536 point FFT (fig. 1, element "AD Converter" and "II. Experiments"), but does not disclose sampling at least 1024 points from a digitized version of the tapped signal and then determining the average power from those plurality of points. Ames discloses monitoring optical power using a photodiode following by an current to voltage conversion followed by A to D conversion of the voltage followed by sampling the digital voltage signal for some inherent predetermined amount of time and then calculating the average optical power using the sampled digital voltage (fig. 1 and col. 5, lines 32-50 and col. 6, lines 1-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the optical power detection method of Shin with the digital average optical power detection method of Ames, to provide the advantage of being

able to store the calculated optical power values in memory for monitoring. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to calculate the average optical in the combination using the same 65536 samples (which reads on "at least 1024") from the digital signal used for the noise power density FFT, so that the accuracy of the average optical power measurement corresponds to the resolution of 65536 point FFT.

Regarding claim 16, the combination of Shin and Ames discloses the method of Claim 5, and discloses that the predetermined amount of time is at least 10 ms (Shin: section "II. Introduction" where the time needed to collect 65536 samples at 250 kHz is approximately 262 ms).

Regarding claim 17, the combination of Shin and Ames discloses the method of Claim 5, but does not disclose that the plurality of points is approximately 1024 points. However, since Ames discloses sampling the A to D converted voltage signal for an inherent predetermined amount of time and then calculating the average optical power using the sampled digital voltage (Ames: col. 6, lines 1-47), it would have been obvious to one of ordinary skill in the art at the time of the invention to calculate the average optical power of the A to D converted continuous voltage using approximately 1024 continuous samples for the calculation, since averaging over any large number of points results in a more accurate average than averaging over a small number of points.

4. Claims 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chung et al. ("Chung") (US Patent No. 6433864) in view of Kang (US Patent No. 6268943).

Regarding claim 1, Chung discloses a method of utilizing performance monitor cells to monitor a multiplexer, comprising: tapping a portion of a signal from a first channel in the multiplexer by utilizing a first performance monitor, wherein the first optical performance monitor

comprises a first coupler, a first photodiode and a first amplifier (fig. 7, first element "OSNR monitor" and col. 7, line 59 to col. 8, line 7; and fig. 3 and col. 5, line 51 to col. 6, line 21 applicable to fig. 7, first element "OSNR monitor"); tapping a portion of a signal from a second channel in the multiplexer by utilizing a second performance monitor, wherein the second optical performance monitor comprises a second coupler, a second photodiode and a second amplifier (fig. 7, second element "OSNR monitor" and col. 7, line 59 to col. 8, line 7; and fig. 3 and col. 5, line 51 to col. 6, line 21 applicable to fig. 7, second element "OSNR monitor"). Chung discloses an analog-to-digital converter coupled to the amplifier in each OSNR monitor (fig. 3, elements 105 and 106, applicable for each OSNR monitor), and sending each digitized signal to a digital signal processor to calculate a channel power value and subsequently report an optical to noise ratio (fig. 3, element 108 and col. 6, lines 57-61, for each OSNR monitor), but does not disclose one A/D converter that converts a signal generated by each amplifier of the OSNR monitors. However, Kang discloses a single multi-channel A/D converter, used in an optical detection application, which has multiple inputs and multiple respective outputs (fig. 2, element 116). It would have been obvious to one of ordinary skill in the art at the time of the invention to consolidate the A/D converters of the OSNR monitors of Chung, using a single multi-channel A/D converter with multiple inputs and multiple outputs in place of the plurality of individual A/D converters, since the single multi-channel A/D converter would produce the same results as the plurality of A/D converters, but without the need for several separate converters.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claim 18 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 11/546075 in view of Chung (US Patent No. 6433864).

Regarding claim 18, 11/546075 claims utilizing performance monitor cells to monitor a multiplexer, comprising: tapping a portion of a signal from a first channel in the multiplexer by utilizing a first performance monitor, wherein the first optical performance monitor comprises a first coupler, a first photodiode and a first amplifier (claim 1 lines 2-6); tapping a portion of a signal from a second channel in the multiplexer by utilizing a second performance monitor, wherein the second optical performance monitor comprises a second coupler, a second photodiode and a second amplifier (claim 1 lines 7-12); sending a signal generated by the first amplifier and sending a signal generated by the second amplifier to an analog-to-digital converter and converting the signal generated by each amplifier from an analog signal to a digital signal by utilizing the analog-to-digital converter (claim 1 lines 13-15). Claim 1 of 11/546075 does not recite sending each digitized signal to a digital signal processor to calculate a channel power value and subsequently report an optical to noise ratio. In fact, claim 1 of 11/546075 does disclose any actual performance monitoring function after the A/D conversions. However, Chung discloses OSNR monitoring of channels based on tapping each channel

signal, monitoring the optical power of each signal, performing an FFT based on a digitized version of each signal and then calculating the OSNR (fig. 7, "OSNR monitor" elements and col. 7, line 59 to col. 8, line 7; and fig. 3 and col. 5, line 51 to col. 6, line 21 applicable to each "OSNR monitor" of fig. 7). In light of Chung, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the A/D converter outputs of claim 1 of 11/546075 for an actual performance monitoring purpose, namely, measuring the optical power of each channel, calculating the FFT, and then calculating the OSNR for each channel.

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

7. Applicant's arguments filed 11 October 2007 have been fully considered and they are not persuasive. Ames doesn't specifically disclose how many points are used for the average power calculation; however, 1024 would have been obvious as described above. Also, the Applicant's arguments are not persuasive with respect to the new "predetermined time" limitation of claim 3, and the "at least 1024 data points" limitation of claim 15. The sampling is inherently done for a predetermined time, and the obvious use of 65536 points for the average power determination of the combination reads on "at least 1024 data points", as described in the rejections above.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

9. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SKL

SHI K. LI
PRIMARY PATENT EXAMINER